EPA/ROD/R08-91/051
1991

EPA Superfund
Record of Decision:

ROCKY MOUNTAIN ARSENAL (USARMY)
EPA ID: CO5210020769
OU 26
ADAMS COUNTY, CO
09/05/1991

Text:

THIS ACTION HAS PROGRESSED FROM THE INITIAL DOCUMENTATION STUDIES, FIELD SURVEYS, SAMPLING, MONITORING, AND DECONTAMINATION FOR SOME OF THE RMA CHEMICAL PROCESS PIPING/EQUIPMENT TO MONITORING, DECONTAMINATING AND DISMANTLING. THESE ACTIVITIES NEED TO BE CONTINUED WITH RESPECT TO THE REMAINING CHEMICAL PROCESS PIPING/EQUIPMENT AND MATERIALS AT RMA IN ORDER TO FACILITATE FINAL CLEANUP.

COMPLETED OPERATIONS
SAMPLING OPERATIONS

DURING 1989, THE US ARMY ANALYZED 203 SAMPLES OF AIR INSIDE PIPING AND EQUIPMENT FOR AGENT-VAPOR CONCENTRATIONS IN SOME OF THE BUILDINGS LOCATED IN THE NORTH AND SOUTH PLANTS. FORTY-NINE OF THOSE SAMPLES INDICATED CONCENTRATION LEVELS SLIGHTLY ABOVE THE DECONTAMINATION LIMIT AS ESTABLISHED BY FEDERAL REGULATIONS. THERE WERE NO LOST-TIME ACCIDENTS.

DECONTAMINATION OPERATIONS

DURING 1990, THE US ARMY DECONTAMINATED 34 PIPING/EQUIPMENT SEGMENTS THAT HAD BEEN PREVIOUSLY SAMPLED IN THE NORTH PLANTS. PROCEDURES AND WORK SITES WERE APPROVED BY THE AMCCOM-SAFETY AND AMC-FIELD SAFETY. THERE WERE NO LOST-TIME ACCIDENTS. STANDARD US ARMY PROCEDURES WERE UTILIZED. SAFETY, OPERATIONAL, AND ENVIRONMENTAL WORK PLANS WERE APPROVED BY THE ARMAMENT, MUNITIONS AND CHEMICAL COMMAND (AMCCOM-SAFETY) AND AMC-FIELD SAFETY. THE BUILDINGS WERE MONITORED WITH REALTIME AGENT MONITORS (MINICAMS) TO ENSURE THAT NO AGENT VAPORS EXISTED BEFORE, DURING, OR FOLLOWING SAMPLING OPERATIONS

ONE-TON CONTAINER MONITORING OPERATIONS

THE US ARMY SAMPLED 2,354 ONE-TON CONTAINERS FOR CHEMICAL-AGENT VAPORS. STANDARD DOD PROCEDURES WERE UTILIZED. FIVE HUNDRED FORTY-SEVEN CONTAINERS EXHIBITED EITHER GB, HD, L, OR VX AGENT-VAPOR CONCENTRATIONS INSIDE THE CONTAINERS ABOVE THE DECONTAMINATION LIMITS ESTABLISHED BY FEDERAL REGULATIONS.

CAPH
CHEMICAL AGENT PROGRAM HISTORY
GENERAL

ROCKY MOUNTAIN ARSENAL (RMA) WAS ESTABLISHED IN 1942 WITH THE MISSION OF MANUFACTURING AND ASSEMBLING MUSTARD (BLISTERING AGENT) AND INCENDIARY MUNITIONS. DURING WORLD WAR II, THE ARSENAL MANUFACTURED CHEMICAL AND INCENDIARY MUNITIONS UNTIL 1945 WHEN IT WAS PLACED IN STANDBY STATUS. PORTIONS OF THE ARSENAL WERE THEN LEASED TO PRIVATE INDUSTRY FOR THE PRODUCTION OF COMMERCIAL PESTICIDES AND HERBICIDES. THE PRINCIPAL LESSEE WAS SHELL CHEMICAL COMPANY WHICH PRODUCED VARIOUS COMMERCIAL PESTICIDES AND HERBICIDES UNTIL 1982.

RMA WAS REACTIVATED IN 1950 DURING THE KOREAN EMERGENCY TO PRODUCE CHEMICAL AND INCENDIARY MUNITIONS. ALSO DURING THIS PERIOD BETWEEN 1951 AND 1953, THE NERVE AGENT PLANT WAS CONSTRUCTED. GB (NERVE AGENT) WAS MANUFACTURED FROM 1953 TO 1957. MUNITIONS WERE FILLED WITH GB AGENT FROM 1953 TO 1969.

IN MAY 1969, THE DEPARTMENT OF THE ARMY DECIDED TO DISPOSE OF CERTAIN CHEMICAL MUNITIONS WHICH WERE OBSOLETE AND EXCESS TO THE NATIONAL DETERRENT STOCKPILE. RMA INITIATED THE DESTRUCTION OF MUSTARD IN OCTOBER 1969 AND COMPLETED THE PROJECT IN JULY 1974. THE DESTRUCTION OF

GB AGENT AND MUNITIONS OCCURRED BETWEEN 1973 AND 1976.

VARIOUS CHEMICAL AGENTS WERE DESTROYED AT RMA FROM 1972 TO 1985. AFTER 1985, THE PROGRAM MANAGER FOR CLEAN UP OF RMA WAS ESTABLISHED WITH ENVIRONMENTAL CLEAN UP AS THE ONLY MISSION.

#OBJ
OBJECTIVES

GENERAL

THE OBJECTIVES OF THIS ACTION ARE TO:

* SAMPLE CHEMICAL PROCESS EQUIPMENT/PIPING AND ANCILLARY MATERIALS TO DETERMINE DECONTAMINATION STATUS.

* DECONTAMINATE IF CHEMICAL-AGENT VAPORS ARE FOUND INSIDE THE PIPING/EQUIPMENT ABOVE DECONTAMINATION LIMITS AS ESTABLISHED BY FEDERAL REGULATIONS.

* DISMANTLE EQUIPMENT/PIPING AND ANCILLARY MATERIALS IN PREPARATION FOR REMOVAL/DISPOSAL.

#AL
ACTION ALTERNATIVES

GENERAL

ACTIVITIES UNDER THIS ACTION WILL BE PERFORMED IN ACCORDANCE WITH APPLICABLE REGULATIONS AND REQUIREMENTS. SPECIFIC METHODS AND PROCEDURES FOR THESE ACTIVITIES WILL BE IN ACCORDANCE WITH AMC 385-131, ARMY REGULATIONS. THE ONLY ALTERNATIVE TO THESE METHODS IS NO ACTION.

THE NO-ACTION ALTERNATIVE CONSISTS OF TAKING NO ACTION TO SAMPLE, DECONTAMINATE, AND DISMANTLE CHEMICAL PROCESS EQUIPMENT/PIPING AND ANCILLARY MATERIALS. THE NO-ACTION ALTERNATIVE IS NOT ACCEPTABLE BECAUSE IT WOULD MAKE IMPLEMENTATION OF THE FINAL REMEDY MORE DIFFICULT AND DELAY THE POSSIBLE REUSE OF THE EQUIPMENT/MATERIALS.

#COE
CHRONOLOGY OF EVENTS

GENERAL

THE SIGNIFICANT EVENTS LEADING TO THE PROPOSED DECISION TO SAMPLE, DECONTAMINATE, AND DISMANTLE CHEMICAL PROCESS PIPING/EQUIPMENT AND ANCILLARY MATERIALS AT RMA ARE LISTED BELOW.

DATE	EVENT
1987	US ARMY INITIATED THE SURVEY OF FORMER CHEMICAL PROCESS EQUIPMENT/PIPING IN NORTH AND SOUTH PLANTS AT RMA.
1988	US ARMY COMPLETED THE SURVEY OF CHEMICAL PROCESS PIPING/EQUIPMENT SAMPLING PLAN.
1989	US ARMY INITIATED SAMPLING OF PIPING/EQUIPMENT IN SOME BUILDINGS IN THE NORTH AND SOUTH PLANTS.
1990	US ARMY DECONTAMINATED PIPING/EQUIPMENT IN SOME BUILDINGS IN

THE NORTH PLANTS.

1990 US ARMY SAMPLED 2,354 ONE-TON CONTAINERS.

#SOI
SUMMARY OF THE IRA

GENERAL

ACTIVITIES UNDER THIS IRA WILL BE PERFORMED IN ACCORDANCE WITH APPLICABLE REGULATIONS AND REQUIREMENTS. SPECIFIC METHODS AND PROCEDURES FOR THESE ACTIVITIES WILL BE IN ACCORDANCE WITH US ARMY REGULATIONS, AMCR-385-131.

IMPLEMENTATION OF THE ACTION TO SAMPLE, DECONTAMINATE, AND DISMANTLE CHEMICAL PROCESS EQUIPMENT/PIPING# AND OTHER ANCILLARY MATERIAL IS THE PREFERRED ALTERNATIVE FOR THE FOLLOWING REASONS:

* FACILITATE THE FINAL REMEDY FOR CLEAN UP OF CHEMICAL PROCESS BUILDINGS AND STRUCTURES.

* VERIFY DECONTAMINATION STATUS OF CHEMICAL PROCESS PIPING/EQUIPMENT AND OTHER ANCILLARY MATERIALS.

* REMOVAL FOR REUSE OR DISPOSAL OF CHEMICAL PROCESS EQUIPMENT/PIPING AND OTHER ANCILLARY MATERIALS.

SAMOLINO, DECONTAMINATION, AND DISMANTLING OF CHEMICAL PROCESS PIPING AND EQUIPMENT IN THE NORTH AND SOUTH PLANTS

THE SCOPE FOR THIS OPERATION WILL INCLUDE:

* SAMPLING TO DETERMINE THE LEVEL OF DECONTAMINATION INSIDE PIPING/EQUIPMENT AS IDENTIFIED IN THE SAMPLING OPERATIONS.

* DECONTAMINATION OF PIPING/EQUIPMENT.

* DISMANTLING OF PIPING/EQUIPMENT.

BUILDINGS COVERED ARE THE FOLLOWING:

SOUTH PLANTS

* BUILDINGS 537, 538, 413, 422, 512, 514, AND 742A WHICH WERE USED FOR MUSTARD-AGENT OPERATIONS DURING WORLD WAR II AND DEMILITARIZATION DURING THE 1970S.

* BUILDINGS 523 AND 413 WHICH WERE USED FOR WHITE PHOSPHORUS OPERATIONS BETWEEN 1943 THROUGH 1946.

* OTHER BUILDINGS NOT LISTED HERE WILL BE PART OF THIS PROJECT AND WILL BE IDENTIFIED AS SPECIFIC WORK PLANS ARE PREPARED.

* STORAGE YARD.

NORTH PLANTS

* BUILDINGS 1501, 1503, 1506, 1601, 1601A, 1603, 1606,1611, AND 1703 WHICH WERE USED FOR GB MANUFACTURING, STORAGE,

AND MUNITIONS FILLING.

* OTHER BUILDINGS NOT LISTED HERE WILL BE PART OF THIS PROJECT AND WILL BE IDENTIFIED AS SPECIFIC WORK PLANS ARE PREPARED.

* STORAGE YARD.

BUILDING DESCRIPTIONS

GENERAL

THE NORTH AND SOUTH PLANTS IN RELATION TO OTHER AREAS AT RMA ARE SHOWN IN FIGURE 6.2-1.

SOUTH PLANTS

BUILDING LOCATIONS IN THE SOUTH PLANTS AREA ARE SHOWN IN FIGURE 6.2-2.

BUILDING 537

BUILDING 537 WAS BUILT IN 1945. THIS BUILDING HAS BEEN USED FOR VARIOUS CHEMICAL OPERATIONS THROUGHOUT THE YEARS AND CONTAINS SOME EQUIPMENT AND PIPING.

BUILDING 538

THIS BUILDING WAS CONSTRUCTED IN 1945. THE BUILDING WAS DESIGNED TO CONTAIN DISPOSAL EQUIPMENT (MATERIAL HANDLING, CRUSHER, AND THREE FURNACES) FOR DECONTAMINATING 55-GALLON DRUMS WHICH WERE DRAINED OF MUSTARD IN BUILDING 537. IN SUBSEQUENT YEARS, THE BUILDING FURNACES WERE USED TO DECONTAMINATE METAL PARTS GENERATED BY THE DEMILITARIZATION OPERATIONS IN BUILDING 537. IN THE 1970S, THE FURNACES WERE USED TO INCINERATE MUSTARD. THIS BUILDING CONTAINS PIPING AND EQUIPMENT.

BUILDING 523

THE FACILITY WAS PREVIOUSLY USED TO LOAD GRENADES WITH WHITE PHOSPHORUS. THIS BUILDING CONTAINS SOME PIPING AND EQUIPMENT.

BUILDING 413

THIS BUILDING CONTAINS STORAGE TANKS AND PIPING AND EQUIPMENT USED FOR WHITE PHOSPHORUS OPERATIONS.

BUILDING 422

BUILDING 422 IS A TWO-STORY STRUCTURE WITH SINGLE-STORY ADDITIONS. THE BUILDING WAS ORIGINALLY USED TO FILL TON CONTAINERS AND 55-GALLON DRUMS WITH MUSTARD. THE BUILDING WAS LEASED BY JULIUS HYMAN & COMPANY FOR MANUFACTURING PESTICIDES AND CONTAINS SOME EQUIPMENT AND PIPING.

BUILDING 512

BUILDING 512 WAS USED WITH THE ARMY'S MUSTARD DISTILLATION PROGRAM FOR THE FILLING OF TON CONTAINERS. IMMEDIATELY FOLLOWING THE CONCLUSION OF THIS PROGRAM, THE ARMY THOROUGHLY DECONTAMINATED ALL PIPING AND PROCESS EQUIPMENT. IN 1947, BUILDING 512 WAS LEASED TO SHELL OIL COMPANY FOR USE IN THE MANUFACTURE OF PESTICIDES. THERE HAS BEEN NO USE OF THIS BUILDING SINCE 1982. THE BUILDING CONTAINS PIPING AND EQUIPMENT.

BUILDING 514

BUILDING 514 WAS USED IN THE ARMY'S MUSTARD DISTILLATION PROGRAM FOR THE WASHING AND DISTILLATION OF MUSTARD AGENT. IMMEDIATELY FOLLOWING THE CONCLUSION OF THIS PROGRAM, THE ARMY THOROUGHLY DECONTAMINATED ALL PIPING AND PROCESS EQUIPMENT. IN 1947, THE BUILDING WAS LEASED TO JULIUS HYMAN & COMPANY FOR USE IN THE MANUFACTURE OF PESTICIDES. THERE HAS BEEN NO USE OF THIS BUILDING SINCE 1982. THIS BUILDING CONTAINS PIPING AND EQUIPMENT.

BUILDING 742A

BUILDING 742A CONTAINS PIPING AND TANKS USED IN THE MUSTARD FILLING PROGRAM AT RMA.

NORTH PLANTS

GENERAL

BUILDING LOCATIONS IN THE NORTH PLANTS AREA ARE SHOWN IN FIGURE 6.2-3.

BUILDING 1501

BUILDING 1501 WAS CONSTRUCTED IN 1951 - 1953 TO PRODUCE AGENT GB. PRODUCTION OF AGENT GB CEASED IN 1957. THE BUILDING WAS UTILIZED IN THE MID-1970S TO DESTROY AGENT GB FROM DEMILITARIZATION OPERATIONS.

BUILDING 1506

THIS BUILDING CONTAINS GB STORAGE TANKS. BUILDING 1506 IS A CONCRETE STRUCTURE, THE MAJORITY OF WHICH IS UNDERGROUND. SOME TRANSFER PIPING DOES EXIST IN THE BUILDING.

BUILDINGS 1601 AND 1601A

BUILDINGS 1601 AND 1601A WERE USED TO FILL VARIOUS MUNITIONS AND TON CONTAINERS WITH GB. THE LAST FILLING OPERATION IN THE BUILDING TOOK PLACE IN 1969. SOME EQUIPMENT DOES EXIST IN THESE BUILDINGS.

BUILDINGS 1503/1603

BUILDINGS 1503/1603 ARE THE SCRUBBER SYSTEM FOR THE GB PLANT AND ARE CONSTRUCTED PARTIALLY UNDERGROUND WITH REINFORCED CONCRETE FLOORS AND WALLS AND A REMOVABLE CONCRETE SLAB ROOF. THESE FACILITIES CONTAIN PIPING AND EQUIPMENT.

BUILDING 1606

BUILDING 1606 WAS USED FOR BOMB ASSEMBLY AND ALSO THE DEMILITARIZATION OF THE BOMBS IN 1973 - 1976. THE BUILDING HAS BEEN INACTIVE SINCE 1976. THIS BUILDING CONTAINS PIPING AND EQUIPMENT.

BUILDING 1703

BUILDING 1703 WAS USED FOR SPRAY-DRYER OPERATIONS WHICH SUPPORTED THE GB DEMILITARIZATION PROGRAM. THIS BUILDING CONTAINS PIPING AND EQUIPMENT.

ANCILLARY MATERIALS

TON CONTAINER SAMPLING AND DECONTAMINATION - GENERAL

THE TON CONTAINERS WERE FILLED WITH EITHER MUSTARD (HD), SARIN (GB), AGENT VX, LEWISITE (L), OR PHOSGENE (CG). THESE CONTAINERS WERE DRAINED, CHEMICALLY DECONTAMINATED, AND SOME WERE THERMALLY DECONTAMINATED. HOWEVER, DUE TO SOME RECORDS NOT BEING AVAILABLE, THE

ARMY WILL DETERMINE THE DECONTAMINATION STATUS OF THE CONTAINERS.

DURING THE SUMMER OF 1990, 2,354 TON CONTAINERS WERE SAMPLED FOR THE CHEMICAL AGENTS GB, HD, AND VX AT LEVELS ESTABLISHED BY FEDERAL REGULATIONS AND L AT HIGHER SCREENING LEVELS.

TON CONTAINERS - PROPOSED WORK

TON CONTAINERS WILL BE DECONTAMINATED AND SAMPLED AS NECESSARY TO ENSURE THAT THEY MEET THE DECONTAMINATION LIMITS ESTABLISHED BY FEDERAL REGULATIONS.

ANCILLARY MATERIALS IN STORAGE - PROPOSED WORK

ANCILLARY MATERIALS IN STORAGE WILL BE SAMPLED AND DECONTAMINATED AS NECESSARY TO MEET DECONTAMINATION LIMITS ESTABLISHED BY FEDERAL REGULATIONS.

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY ARE AN INTEGRAL PART OF THIS WORK AND ARE REQUIRED UNDER EXISTING ARMY SAFETY REGULATIONS/PROCEDURES. THIS PLAN WILL ADDRESS ALL HEALTH AND SAFETY REGULATIONS DEEMED NECESSARY TO IMPLEMENT THIS PROGRAM WITH MINIMUM RISKS TO OPERATIONS PERSONNEL AS WELL AS THE GENERAL PUBLIC.

AS PREVIOUSLY STATED, THESE METHODS AND PROCEDURES REGARDING PROTECTION OF THE HEALTH AND SAFETY OF PERSONNEL INVOLVED IN THESE OPERATIONS ARE PROVEN BY YEARS OF SUCCESSFUL PROJECTS THAT HAVE BEEN COMPLETED AT RMA. THE HEALTH AND SAFETY PLAN WILL BE DEVELOPED AND INCLUDED IN THE IMPLEMENTATION PLANS FOR THIS PROGRAM.

MEDICAL EXAMINATION

ALL PERSONNEL ASSIGNED TO PERFORM SAMPLING, DECONTAMINATION, AND DISMANTLING OPERATIONS WILL HAVE A MEDICAL EXAMINATION PRIOR TO WORKING AT RMA. THIS EXAMINATION WILL INCLUDE BLOOD CHOLINESTERASE TESTS TO ESTABLISH A BASE LINE LEVEL AND FITNESS TO WEAR RESPIRATORY EQUIPMENT AND OTHER PERSONAL PROTECTIVE CLOTHING.

KEY MEDICAL PERSONNEL

KEY MEDICAL PERSONNEL NECESSARY TO SUPPORT ANY EMERGENCIES WILL BE THE EMERGENCY MEDICAL TECHNICIANS (EMTS) PROVIDED BY THE RMA FIRE DEPARTMENT. THE FITZSIMMONS ARMY MEDICAL CENTER (FAMC) WILL PROVIDE MEDICAL CARE FOR SERIOUS INJURIES OR EXPOSURE TO CHEMICAL AGENTS. ALL ASSISTING PERSONNEL AT FAMC HAVE BEEN TRAINED TO ATTEND TO THESE EMERGENCIES. AMI PRESBYTERIAN HOSPITAL IN AURORA WILL BE USED FOR MINOR MEDICAL CARE WHEN NECESSARY.

EMERGENCY RESPONSE EQUIPMENT

THE RMA FIRE DEPARTMENT WILL PROVIDE THE EMERGENCY MEDICAL RESPONSE EQUIPMENT AND PERSONNEL.

#IRAP
INTERIM RESPONSE ACTION PROCESS

GENERAL

THE ACTIVITIES PROPOSED IN THIS DOCUMENT ARE BEING COORDINATED PURSUANT TO SECTION XXIL OF THE FFA WHICH EXPLAINS THE INTERIM RESPONSE ACTION (IRA) PROCESS. SECTION XXLL ESTABLISHES A SPECIFIC IRA PROCESS TO BE CONDUCTED AT RMA AND A PROCEDURE FOR COORDINATING SUCH ACTIONS. THE IRA

PROPOSED IN THIS DOCUMENT WILL FOLLOW THESE PROCEDURES.

#ARAR

APPLICABLE OR RELEVANT AND APPROPRIATE
REQUIREMENTS (ARAR) FOR THE PROPOSED CHEMICAL
PROCESS-RELATED ACTIVITIES IRA

AMBIENT OR CHEMICAL-SPECIFIC ARARS

AMBIENT OR CHEMICAL-SPECIFIC REQUIREMENTS SET CONCENTRATION LIMITS OR RANGES IN VARIOUS ENVIRONMENTAL MEDIA FOR SPECIFIC HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS. SUCH ARARS EITHER SET PROTECTIVE CLEANUP LEVELS FOR THE CHEMICALS OF CONCERN IN THE DESIGNATED MEDIA OR INDICATE AN APPROPRIATE LEVEL OF DISCHARGE.

THE OBJECTIVES OF THIS ACTIVITY ARE DISCUSSED ELSEWHERE IN THIS DOCUMENT. THIS ACTIVITY WILL BE IMPLEMENTED PRIOR TO THE FINAL REMEDIATION TO BE UNDERTAKEN IN THE CONTEXT OF THE ON POST OPERABLE UNIT ROD. THE MEDIA OF CONCERN IS AIR AND THE CHEMICAL-SPECIFIC REQUIREMENTS LISTED BELOW APPLY TO LEVELS OF THE NAMED COMPOUND WHICH REMAIN IN THE AIR AFTER COMPLETION OF THE REMEDIAL ACTIVITIES RELATED TO THIS ACTION.

ANY LIQUID OR OTHER WASTE MATERIAL GENERATED PURSUANT TO THIS ACTIVITY WILL BE APPROPRIATELY MANAGED ONSITE AND ANY DISPOSAL OF SUCH MATERIAL WILL TAKE PLACE UNDER A DIFFERENT PROGRAM, NOT THIS IRA.

CHEMICAL-SPECIFIC STANDARDS FOR THESE COMPOUNDS WERE DEVELOPED PURSUANT TO 50 USC S 1512 AND THE FINAL STANDARDS LISTED BELOW ARE BASED UPON THE FINAL RECOMMENDATIONS OF THE CENTER FOR DISEASE CONTROL (CDC), US DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS), ACTING PURSUANT TO THE ABOVE CITED STATUTE, PUBLISHED AT 53 FED. REG. 8504 (MARCH 15, 1988). THESE STANDARDS ARE FOR THE WORKER POPULATION, SINCE THAT IS THE ONLY REALISTIC POPULATION WHICH COULD BE EXPOSED TO CONCENTRATIONS OF THESE COMPOUNDS INSIDE THE BUILDINGS, AND ARE BASED UPON AN 8-HOUR TIME WEIGHTED AVERAGE (TWA). THE TWA IS THE INDIVIDUAL'S AVERAGE AIRBORNE EXPOSURE IN ANY 8-HOUR WORK SHIFT OF A 40-HOUR WORK WEEK, WHICH SHALL NOT BE EXCEEDED. IT IS CALCULATED TO PROVIDE PROTECTION OVER AN ENTIRE WORKING LIFETIME. BY REDUCING THE LEVELS OF THESE COMPOUNDS TO THOSE INDICATED BELOW, AMPLE PROTECTION WILL BE PROVIDED TO NONWORKER POPULATIONS OUTSIDE THESE BUILDINGS BECAUSE SUCH POPULATIONS ONLY EXIST AT SUCH A DISTANCE THAT NO REALISTIC POTENTIAL RISK OF EXPOSURE WILL REMAIN FOR SUCH NONWORKER POPULATIONS. THE CHEMICAL-SPECIFIC ARARS DETERMINED RELEVANT AND APPROPRIATE TO APPLY IN THE CONTEXT OF THIS ACTIVITY ARE:

COMPOUND	ARAR LEVEL	SOURCE
GB*	0.0001 MG/M3	53 FR 8504
VX*	0.00001 MG/M3	53 FR 8504
HD**	0.003 MG/M3	53 FR 8504
L***	0.003 MG/M3	53 FR 8504

* GB (SARIN) AND VX, NERVE AGENTS
** MUSTARD, A BLISTER AGENT
*** LEWISITE, A BLISTER AGENT

FURTHER REQUIREMENTS RELATED TO PERMISSIBLE EXPOSURES ARE CONTAINED IN AMC REGULATION 385-131, SEE ATTACHMENT A. PURSUANT TO THIS REGULATION, NO UNPROTECTED INDIVIDUAL WILL BE EXPOSED TO CONCENTRATIONS ABOVE THE FOLLOWING LIMITS, REGARDLESS OF THE 8-HOUR AVERAGE:

COMPOUND	LIMIT
GB	0.2 MG/M3
VX	0.4 MG/M3
MUSTARD	0.003 MG/M3

SOIL

THERE ARE NO ACTION-SPECIFIC ARARS THAT PERTAIN TO THE DRILLING OR EXCAVATION OF SOIL DURING THE IMPLEMENTATION OF ANTICIPATED REMEDIAL ACTIONS. ALTHOUGH NOT AN ARAR, REMOVAL OF SOIL FROM AREAS WHERE REMEDIAL ACTIONS ARE ANTICIPATED WILL BE PERFORMED IN ACCORDANCE WITH THE PROCEDURES SET FORTH IN THE TASK NO. 32 TECHNICAL PLAN SAMPLING WASTE HANDLING (NOVEMBER 1987) AND EPA'S JULY 12, 1985, MEMORANDUM ENTITLED "EPA REGION VIII PROCEDURE FOR HANDLING OF MATERIALS FROM DRILLING, TRENCH EXCAVATION, AND DECONTAMINATION DURING CERCLA RI/FS OPERATIONS AT THE ROCKY MOUNTAIN ARSENAL." ALL SOILS GENERATED BY EXCAVATION DURING THE COURSE OF ANTICIPATED RESPONSE ACTION, EITHER AT SURFACE OR SUBSURFACE, WILL BE RETURNED TO THE LOCATION FROM WHICH THEY ORIGINATED (I.E., LAST OUT, FIRST IN).

LOCATION-SPECIFIC ARARS

LOCATION-SPECIFIC REQUIREMENTS SET RESTRICTIONS ON ACTIVITIES DEPENDING ON THE CHARACTERISTICS OF THE SITE OR THE IMMEDIATE ENVIRONMENT AND FUNCTION SIMILAR TO ACTION-SPECIFIC REQUIREMENTS. ALTERNATIVE REMEDIAL ACTIONS MAY BE RESTRICTED OR PRECLUDED DEPENDING ON THE LOCATION OR CHARACTERISTICS OF THE SITE AND THE REQUIREMENTS THAT APPLY TO IT.

THIS ACTIVITY WILL OCCUR ALMOST TOTALLY WITHIN FORMER PROCESS BUILDINGS AND HAS LITTLE, IF ANY, POTENTIAL TO ADVERSELY AFFECT THE NATURAL ENVIRONMENT OR WILDLIFE IN THE AREA OF THE ACTIVITY.

PARAGRAPH 44.2 OF THE FFA PROVIDES THAT "WILDLIFE HABITAT(S) SHALL BE PRESERVED AND MANAGED AS NECESSARY TO PROTECT ENDANGERED SPECIES OF WILDLIFE TO THE EXTENT REQUIRED BY THE ENDANGERED SPECIES ACT (16 USC 1531 ET SEG.), MIGRATORY BIRDS TO THE EXTENT REQUIRED BY THE MIGRATORY BIRD TREATY ACT (16 USC 703 ET SEG.), AND BALD EAGLES TO THE EXTENT REQUIRED BY THE BALD EAGLE PROTECTION ACT, 16 USC 688 ET SEG."

WHILE THIS PROVISION IS NOT AN ARAR, THE STATUTES CITED THEREIN ARE ARARS APPLICABLE TO THIS ACTIVITY AND WILL BE COMPLIED WITH. COORDINATION WILL BE MAINTAINED WITH THE US FISH AND WILDLIFE SERVICE TO ENSURE THAT NO SUCH ADVERSE IMPACT ARISES FROM IMPLEMENTATION OF THIS ACTIVITY.

THE PROVISIONS OF 40 CFR 6.302(A) AND (B) REGARDING CONSTRUCTION THAT WOULD HAVE AN ADVERSE IMPACT ON WETLANDS OR BE WITHIN A FLOODPLAIN ARE CONSIDERED RELEVANT AND APPROPRIATE TO APPLY IN THE CONTEXT OF THIS ACTIVITY. BASED UPON WHERE THIS ACTIVITY WILL TAKE PLACE, THE ARMY BELIEVES THAT THERE WILL BE NO ADVERSE IMPACT ON WETLANDS. HOWEVER, INDIVIDUAL WORK PLANS COULD INCLUDE ACTIVITIES WHICH MAY HAVE IMPACTS ON WETLANDS. AS WORK PLANS ARE DEVELOPED, THEY WILL BE REVIEWED TO DETERMINE IF A POTENTIAL EXISTS FOR ADVERSE IMPACTS ON WETLANDS AND, IF SUCH AN ADVERSE IMPACT IS CONSIDERED PROBABLE, THE REGULATORY PROVISIONS CONCERNING ACTIVITIES AFFECTING WETLANDS WILL BE REVIEWED AND ACTIVITIES CONDUCTED IN ACCORDANCE WITH APPROPRIATE GUIDANCE. COORDINATION WILL BE MAINTAINED WITH THE US FISH AND WILDLIFE SERVICE TO ENSURE THAT ANY SUCH ADVERSE IMPACTS ARE AVOIDED OR MITIGATED.

THE REGULATIONS AT 40 CFR 230 WERE REVIEWED AND DETERMINED NOT TO BE APPLICABLE WITHIN THE CONTEXT OF THIS ACTIVITY BECAUSE NO DISCHARGE OF DREDGED OR FILL MATERIAL INTO WATERS OF THE UNITED STATES IS CONTEMPLATED. BECAUSE THESE REGULATIONS ADDRESS ONLY THE DISPOSAL OF

SUCH MATERIALS INTO WATERS OF THE UNITED STATES, WHICH IS NOT CONTEMPLATED, THEY ARE NOT CONSIDERED TO BE RELEVANT AND APPROPRIATE TO APPLY.

THE REGULATIONS AT 33 CFR 320-330 WERE REVIEWED AND DETERMINED TO BE NEITHER APPLICABLE NOR RELEVANT AND APPROPRIATE BECAUSE THIS ACTIVITY DOES NOT INVOLVE ANY OF THE ACTIVITIES, OR SIMILAR TO THE ACTIVITIES, INTENDED TO BE CONTROLLED BY THESE REGULATIONS AS DEFINED IN 33 CFR S 320.1(B).

ACTION-SPECIFIC ARARS

DESCRIPTION

PERFORMANCE, DESIGN, OR OTHER ACTION-SPECIFIC REQUIREMENTS SET CONTROLS OR RESTRICTIONS ON ACTIVITIES RELATED TO THE MANAGEMENT OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS. THESE ACTION-SPECIFIC REQUIREMENTS MAY SPECIFY PARTICULAR PERFORMANCE LEVELS, ACTIONS, OR TECHNOLOGIES AS WELL AS SPECIFIC LEVELS (OR A METHODOLOGY FOR SETTING SPECIFIC LEVELS) FOR DISCHARGED OR RESIDUAL CHEMICALS.

WORKER PROTECTION

THE PROVISIONS OF AMC REGULATION 385-131 ARE SPECIFICALLY APPLICABLE TO WORKERS INVOLVED IN THIS ACTIVITY BECAUSE THESE PROVISIONS SPECIFICALLY ADDRESS DECONTAMINATION ACTIVITIES FOR THE SPECIFIC COMPOUNDS WHICH ARE ADDRESSED BY THIS ACTIVITY. THE GUIDANCE CONTAINED IN US ARMY ENVIRONMENTAL HYGIENE AGENCY TECHNICAL GUIDES NUMBER 169 AND NUMBER 173 ARE ALSO APPLICABLE TO THIS ACTIVITY. THE REGULATIONS AT 29 CFR 1910.120 ARE ALSO APPLICABLE TO THIS ACTIVITY TO THE EXTENT THEY ARE NOT INCONSISTENT WITH THE REGULATIONS CITED ABOVE WHICH SPECIFICALLY ADDRESS ACTIVITIES RELATED TO DECONTAMINATION ACTIVITIES FOR THESE SPECIFIC COMPOUNDS.

GENERAL ORGANIZATIONAL ACTIVITIES

THE FOLLOWING PERFORMANCE, DESIGN, OR OTHER ACTION-SPECIFIC STATE ARARS HAVE BEEN PRELIMINARY IDENTIFIED BY THE ARMY AS APPLICABLE TO ORGANIZATIONAL ACTIVITIES CONDUCTED PURSUANT TO THIS ACTIVITY:

* COLORADO AMBIENT AIR QUALITY STANDARDS, 5 CCR 1001-14, AIR QUALITY REGULATION A, DIESEL-POWERED VEHICLE EMISSION STANDARDS FOR VISIBLE POLLUTANTS.

* COLORADO NOISE ABATEMENT STATUTE, C.R.S. SECTION 25-12-103.

IN SUBSTANTIVE FULFILLMENT OF COLORADO'S DIESEL-POWERED VEHICLE EMISSION STANDARDS, NO DIESEL MOTOR VEHICLES ASSOCIATED WITH THE ACTIVITY SHALL BE OPERATED IN A MANNER THAT WILL PRODUCE EMISSIONS IN EXCESS OF THOSE SPECIFIED IN THESE STANDARDS.

THE NOISE LEVELS PERTINENT FOR CONSTRUCTION ACTIVITY PROVIDED IN C.R.8. SECTION 25-12-103 WILL BE ATTAINED IN ACCORDANCE WITH THIS APPLICABLE COLORADO STATUTE.

WETLANDS IMPLICATIONS

BASED UPON THE GENERAL AREA WHERE THIS ACTIVITY WILL BE CONDUCTED, THE ARMY DOES NOT BELIEVE THAT ANY WETLANDS COULD BE ADVERSELY AFFECTED. HOWEVER, UNTIL ALL RELATED ACTIVITIES ARE FULLY DESIGNED AND FINAL SITING DECISIONS MADE, IT CANNOT BE DEFINITIVELY DETERMINED THAT NO IMPACT ON WETLANDS WILL OCCUR. IF THE FINAL SITE SELECTIONS AND/OR DESIGN RESULTS IN AN IMPACT ON WETLANDS, THE ARMY WILL REVIEW THE

REGULATORY PROVISIONS CONCERNING WETLANDS IMPACT AND OTHER APPROPRIATE GUIDANCE AND WILL PROCEED IN A MANNER CONSISTENT WITH THOSE PROVISIONS. COORDINATION WILL BE MAINTAINED WITH THE US FISH AND WILDLIFE SERVICE CONCERNING ANY POTENTIAL IMPACTS ON WETLANDS.

RISK ASSESSMENT FOR CHEMICAL PROCESS RELATED ACTIVITIES
INTERIM RESPONSE ACTION

GENERAL

THE ENVIRONMENTAL PROTECTION AGENCY (EPA) AND THE US ARMY HAVE AGREED TO CONDUCT AN INTERIM RESPONSE ACTION (IRA) FOR CHEMICAL PROCESS RELATED ACTIVITIES AT THE ROCKY MOUNTAIN ARSENAL (RMA). THIS IRA IS INTENDED TO HELP MAKE THE IMPLEMENTATION OF THE RECORD OF DECISION (ROD) EASIER BY ELIMINATING ANY CHEMICAL CONTAMINATION ISSUES. THIS DOCUMENT ADDRESSES RISKS ASSOCIATED WITH THE CHEMICAL PROCESS RELATED ACTIVITIES IRA.

INTERIM RESPONSE ACTION SUMMARY

THIS IRA CONSISTS OF SURVEYING EXISTING CHEMICAL PROCESS PIPING/EQUIPMENT AT RMA TO DETERMINE THE LEVELS OF CHEMICAL DECONTAMINATION, MONITORING FOR THE PRESENCE OF CHEMICALS, AND DECONTAMINATING AS REQUIRED IN ORDER TO FACILITATE REUSE OR REMOVAL OF THE EQUIPMENT.

ACTIVITIES UNDER THIS IRA ARE BASED ON US ARMY STANDING PROCEDURES AND REGULATIONS. REQUIREMENTS LOCATED IN THE NUMEROUS SAFETY AND TECHNICAL MANUALS DEVELOPED BY THE US ARMY MATERIAL COMMAND AND ARMAMENT, MUNITIONS AND CHEMICAL COMMAND (AMCCOM) ARE THE ONLY COMPREHENSIVE REGULATIONS REGARDING THIS TYPE OF MILITARY SPECIFIC ACTIVITY.

THE OBJECTIVES OF THE IRA ARE TO:

* SAMPLE CHEMICAL PROCESS PIPING/EQUIPMENT AND ANCILLARY MATERIALS TO VERIFY THE DECONTAMINATION STATUS.

* DECONTAMINATE IF CHEMICAL VAPORS INSIDE THE PIPING/EQUIPMENT ARE FOUND TO BE ABOVE DECONTAMINATION LIMITS ESTABLISHED BY FEDERAL REGULATIONS, AND

* DISMANTLE PIPING/EQUIPMENT IN PREPARATION FOR REUSE OR REMOVAL.

RISK ASSESSMENT SUMMARY

DURING 1989, THE US ARMY ANALYZED 182 SAMPLE POINTS (PIPING/EQUIPMENT SYSTEMS) FOR THE PRESENCE OF THE CHEMICAL AGENT GB. EXTREMELY LOW LEVELS OF AGENT VAPORS WERE DETECTED IN FORTY-THREE (43) OF THESE SAMPLE POINTS. THIS CONFIRMS THAT PIPING AND EQUIPMENT HAD PREVIOUSLY BEEN DECONTAMINATED.

THE WORST-CASE SCENARIO PERTAINING TO THIS IRA WOULD BE THE INSTANTANEOUS RELEASE OF A SMALL QUANTITY (6-10 OZ) OF DECONTAMINATING SOLUTION CONTAINING A VERY LOW CONCENTRATION OF AGENT VAPOR FROM THE SAMPLE POINT THAT HAD THE GREATEST ANALYSIS RESULTS DURING SAMPLING OPERATIONS: 1.64 X (10-4) MG/M + 3. THIS IS AN ESTIMATED AMOUNT RELEASED BEFORE TEAM MEMBERS COULD RESPOND AND CONTAIN THE RELEASE. THE COMPUTER MODEL, CRDC-TR-87021 (D2PC) REV. FEB 88, "PERSONAL COMPUTER PROGRAM FOR CHEMICAL HAZARD PREDICTION" WAS USED TO DETERMINE THE DISTANCE TO ZERO HEALTH EFFECTS BASED ON THIS AMOUNT. THE COMPUTER PROGRAM ESTIMATES THE DOWNWIND HAZARD FROM THE RELEASE OF CHEMICAL AGENT. HAZARD ASSESSMENT IS MADE IN TERMS OF ACCUMULATED DOSAGE OR PEAK CONCENTRATION RESULTING FROM INSTANTANEOUS, CONTINUOUS, OR VARYING RELEASE.

RESULTS ARE STATED IN TERMS OF "DISTANCE TO NO EFFECTS" - A DISTANCE TO WHERE THERE WOULD BE NO HARMFUL EFFECTS TO UNPROTECTED PERSONNEL IN THE IMMEDIATE AREA IF THIS AMOUNT OF AGENT WERE TO BE RELEASED INTO THE AMBIENT ENVIRONMENT.

THE PARAMETERS USED IN THE MODEL WERE THE FOLLOWING:

AGENT - GB
WIND SPEED - 3 TO 4 MILES PER HOUR OUTSIDE BUILDING
TEMPERATURE - 70 DEGREES FAHRENHEIT
RELEASE - INSTANTANEOUS OVER 9 SECONDS
RELEASE INTO AMBIENT AIR OF THE BUILDING

AMOUNT OF RELEASE	"DISTANCE TO NO EFFECTS"
1.64 X (10-4) MG/M3	LESS THAN 1 METER
(HIGHEST CONCENTRATION DETECTED DURING ACTUAL SAMPLING OPERATIONS AT RMA)	
1.64 MG/M3	2 METERS
(10,000 TIMES HIGHER THAN HIGHEST* CONCENTRATION DETECTED DURING SAMPLING OPERATIONS)	
16.40 MG/M3	6 METERS
(100,000 TIMES HIGHER THAN* HIGHEST CONCENTRATION DETECTED DURING SAMPLING OPERATIONS)	
28,300 MG (APPROX 1 OZ NEAT AGENT)*	208 METERS
(17,000 TIMES HIGHER THAN HIGHEST CONCENTRATION DETECTED DURING SAMPLING OPERATIONS)	

* NOTE: THIS EXAMPLE USED ONLY FOR COMPARISON.
* NOTE: THERE IS NO NEAT AGENT AT RMA.

BASED ON THE ACTUAL SAMPLING RESULTS, NO HEALTH RISKS ARE EXPECTED IN THE PERFORMANCE OF THE CHEMICAL PROCESS RELATED IRA FOR PROJECT WORKERS, ON-POST EMPLOYEES, OR THE OFF-POST POPULATION.

ENGINEERING CONTROLS, AS SPECIFIED IN THE STANDING OPERATION PROCEDURES, WILL BE UTILIZED TO GUARD AGAINST THE RELEASE OF ANY AGENT VAPOR INTO THE ATMOSPHERE.

IN A TYPICAL OPERATION INVOLVING SAMPLING, DECONTAMINATION OR DISMANTLING OF EQUIPMENT FOR CHEMICAL AGENT, THE FOLLOWING HEALTH AND SAFETY GUIDELINES WOULD APPLY:

TRAINING:ONE OF THE KEYS TO THE SAFE COMPLETION OF THIS IRA WILL BE TRAINING IN THE KNOWLEDGE OF THE HAZARDS ASSOCIATED WITH THE AGENTS; MEASURES TO CONTROL EXPOSURES; EMERGENCY PROCEDURES AND FIRST AID; AND MEDICAL MONITORING OF SAMPLING PERSONNEL.

PERSONAL PROTECTIVE EQUIPMENT (PPE): PERSONNEL INVOLVED IN SAMPLING, DECONTAMINATION AND DISMANTLING OPERATIONS WILL WEAR PROTECTIVE CLOTHING AND EQUIPMENT CONSISTING OF RESPIRATORS, GLOVES, BOOTS, HOODS, PROTECTIVE COVERALL SUITS, APRONS, AND UNDER GARMENTS.

MONITORING: WORK AREAS WILL BE MONITORED BEFORE, DURING, AND AFTER ALL SAMPLING, DECONTAMINATION, AND DISMANTLING OPERATIONS USING REALTIME CONTINUOUS AIR MONITORS.

VAPOR CONTYROL: AMBIENT AIR AROUND SAMPLING POINTS WILL BE EXHAUSTED THROUGH ACTIVATED CARBON FILTERS TO CONTAIN ANY RELEASE OF VAPORS.

JOB SAFETY ANALYSIS (JSA): JSAS WILL BE CONDUCTED FOR ALL SAMPLING, DECONTAMINATION, AND DISMANTLING OPERATIONS TO ENSURE THAT POTENTIAL HAZARDS ARE IDENTIFIED AND CONTROLLED.